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Research Article

ASSESSMENT AND COMPARISON OF MATERNAL AND PERINATAL OUTCOME AMONG ANAEMIC AND NON ANAEMIC MOTHERS

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A B S T R A C T

Anemia is the most preventable cause of maternal and perinatal mortality and morbidity. This study was carried out to evaluate the maternal and perinatal outcome in pregnancy with severe anaemia. This study was carried out in 420 pregnant women in labour. Patient were divided into Group – A (Haemoglobin<7.0gm/dl, n=210 women) and Group – B (Haemoglobin ≥ 11 gm/dl, n=210 women). Their maternal and perinatal outcome, mode of delivery and postpartum complications were noted and analysed. The maternal and perinatal complications were significantly more in Group – A than in Group – B , Preterm labour (42.8% v/s 14.3%), Preeclampsia (16.1% v/s 3.3%), Sepsis (3.8% v/s 0%), CHF (1.4% v/s 0%), Low birth weight(55.2% v/s 9.1%), Still birth (10.9% v/s 3.30%), IUGR (9.0% v/s5.2 %), Birth Asphyxia (10.9% v/s 0.9%) and Admission in NICU (14.7% v/s9.5 %). Severe anaemia was associated with significantly more maternal and perinatal complications which mandate screening for nutritional deficiency anaemia in pregnant women and also to treat those cases to improve maternal and perinatal outcome.

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INTRODUCTION

Anaemia is the most common nutritional deficiency disorder in the world. [1] WHO has estimated that prevalence of anaemia in pregnant women is 14% in developed and 51% in developing countries and 65 – 75 % in India. [2] In India anaemia antedates pregnancy, is aggravated by increased requirements duringpregnancy and blood loss at delivery, infections in the antenatal and postnatal periods, and the early advent of next pregnancy perpetuates it.[1] Studies have shown that iron deficiency is the major cause of anaemia followed by folate deficiency.[3] In recent years, the contribution of Vitamin B12 deficiency has been highlighted. [3] Anaemia is very often asymptomatic in pregnancy, with the diagnosis being made on routine screening. [4]

It is regarded as the most important preventable cause of maternal and perinatalcomplications. Studies to define the effect of anaemia during pregnancy on the maternal and foetal outcome indicate that different types of decompensation occur with varying degrees of anaemia. Most of the studies suggest that a fall in maternal Hb below 11.0gm/dl is associated with a significant rise in poor maternal and perinatal outcomes such as preterm labour, preeclampsia, sepsis, PPH, maternal mortality, low birth weight, birth asphyxia, apgar score < 7 and early neonatal death.[5]

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***Aim and Objective*:** This study focuses on maternal and perinatal outcome in varying degree of anaemia.

MATERIAL AND METHODS

This prospective hospital based comparative study was conducted on 420 pregnant patient in labour attending Department of Obstetrics and Gynaecology, Government Medical College, Patiala for delivery from Febuary 2016 to January 2017. Pregnant women in labour presenting with severe anaemia (n=210) and with normal Haemoglobin (Hb) (n=210) were included in the study. Women having multiple pregnancies, associated acute blood loss, blood dyscrasia were excluded from the study. Detailed clinical history and examination of the entire patient was taken. Thorough general and systemic examination of the patient was recorded

All the routine investigation along with CBC, and Peripheral blood smear examination were done.
Follow up of these patients was done for foetomaternal outcome.

Statistical Analyses

Statistical analyses were done. The qualitative data were expressed in proportions and percentages and the quantitative data expressed as mean and standard deviations. The differences in proportions were analyzed by using chi square test and the differences in means were analyzed by using student T test. Significance level for tests were determined as 95% (P<0.05).

RESULT

In our study the proportions of the women in Group – A in <20 and >30 years age group were significantly more as compared to Group – B that is 9.0 % v/s 4.3% and 15.7% v/s 2.9% respectively. Proportions of women from rural area, illiterate women, women from lower socioeconomic status and unbooked women were more in Group – A as compared to Group –B : 72.8 % v/s 32.4% , 66.7 % v/s 21.9%, 87.1% v/s 24.3% and 84.7 % v/s 43.8% respectively(Table – 1).

Table 1 Distribution of cases according to baseline characteristics

S.No	Characteristics		Group –A	Group- B
1.	Age (in years)	<20	19(9.0%)	9(4.3%)
		21 – 25	90(42.8%)	117(55.7%)
		26 – 30	68(32.3%)	78(37.1%)
		>30	33(15.7%)	6(2.9%)
	Mean Age (in years)Mean± SD		24.48 ± 3.66	25.13 ± 2.98
2.	Residence	Rural	153(72.8%)	68(32.4%)
		Urban	57(27.1%)	142(67.6%)
3.	Literacy	Illiterate	140(66.7%)	46(21.9%)
		Literate	70(33.3%)	164(78.1%)
4.	Socioeconomic Status	Lower	183(87.1%)	51(24.3%)
		Middle	27(12.9%)	89(42.4%)
		Upper	-	70(33.3%)
5.	Booking Status	Booked Cases	32(15.2%)	118(56.2%)
		Unbooked Cases	178(84.7%)	92(43.8%)

As shown in Table – 2 Proportionof women Group – B belonged to 37 – 40 weeks gestation period were

73.3%.Women with higherparity were significantly more in Group –A (71.9%). Proportion of women who had LSCS was A (30.5%) as compared to Group – B (12.4%). Vaginal delivery was more in Group – B 87.6%. Majority of the women in Group – A and B belonged to parity 2-3

Table 2 Distribution of cases according to Parity Status, Gestational Age and Mode of Delivery

S.No			Group- A	Group– B
1.	Parity	P1	40(19.1%)	64(30.5%)
		P2-3	151(71.9%)	134(63.8%)
		≥P4	19(9.0%)	12(5.7%)
2.	Gestational age (in weeks)Mean± SD	28-32	33(15.7%)	4(1.9%)
		33-36	56(26.6%)	52(24.8%)
		37-40	121(57.6%)	154(73.3%)
3.	Mode Of Delivery	LSCS	64(30.5%)	26(12.4%)
		Vaginal delivery	146(69.5%)	184(87.6%)

In Group – A the proportion of microcytic hypochromic anaemia (79%), macrocytic hypochromic anaemia (11.4%) and dimorphic anaemia (5.7%) was more as compared to Group – B (0.0 %) as shown in Table – 3 .

Table 3 Distribution of cases according to P.B.F Examination

S.No	P.B.F	Group– A	Group - B	Total
1.	Dimorphic	12(5.7%)	0	12
2.	Macrocytic Hypochromic	24(11.4%)	0	24
3.	Microcytic Hypochromic	166(79%)	0	166
4.	Normocytic Normochromic	8(3.8%)	210(100%)	28
5.	Mean Maternal Haemoglobin(gm/dl)	5.64±0.96	12.03±0.63	

Maternal complications: preterm labour (42.8% v/s 14.3%), Preeclampsia (16.1% v/s 3.3%), sepsis (3.8% v/s 0.0 %), CHF (1.4% v/s 0.0%) and third stage complications : PPH and retained placenta (10.4% v/s 0.0 %) were significantly more in Group – Aas seen in Table – 4

Table 4 Distribution of cases according to maternal outcome

S. No	Maternal outcome	Group A	Group B	Total	P value LS
1.	Preterm labour	89(42.8%)	30(14.3%)	119	<0.001S
2.	Preeclampsia	34(16.1%)	7(3.3%)	41	<0.001S
3.	Sepsis	8(3.8%)	0	8	<0.001S
4.	CHF	3(1.4%)	0	3	0.012S
5.	Third Stage Complications (PPH/ Retained Placenta)	22(10.4%)	4(1.9%)	26	0.005S
6.	Maternal Mortality	1(0.47%)	-	1	0.131 NS
7.	Blood Transfusion	184(87.6%)	8(3.8)	192	<0.001S

Perinatal complications were more in anaemic Group – A compared to non – anaemic group B: low birth weight (55.2% v/s 9.1%), Apgar score < 7/10 (10.9% v/s 2.4%), still birth (10.9 % v/s 3.3%), IUGR (9.0% v/s 5.2%), birth asphyxia (10.9% v/s 0.9%) and admission NICU (14.7% v/s 9.5%). However there was no early neonatal death among the both groups (Table – 5).

Table 5 Distribution of cases according to perinatal outcome

S. No	Perinatal outcome	Group A	Group B	Total	P value LS
1.	Birth weight (<2.5 kg)	116(55.2%)	19(9.1%)	135	<0.001S
	Mean Birth Weight	2.49±0.56	2.93±0.33		
2.	APGAR Score (<7/10)	23(10.9%)	5(2.4%)	28	<0.001S
4.	Still Birth	23(10.9%)	7(3.3%)	30	0.039S
5.	IUGR	19(9.0%)	11(5.2%)	30	0.007S
6.	Birth Asphyxia	23(10.9%)	2(0.9%)	25	<0.001S
7.	Early Neonatal Death	0	0	0	
8.	Admission in NICU	31(14.7%)	20(9.5%)	51	<0.001S

DISCUSSION

The majority of women in both groups belonged to 21 – 25 years age group, 42.8% in Group – A and 55.7% in Group – B. In severe anaemia Group –A proportion of younger <20 years (9.0% v/s 4.3%) and older >30 (15.7% v/s 2.9%) years was more compared to group – B, difference was statistically significant. Mean age group of Group – A was 24.48 ± 3.66 and Group – B 25.13 ±2.98; difference was statistically not significant. Verheff*et al* (1999)[6] and Owais*et al* (2011) [7] concluded in their study that age was no longer associated with increased risk of anaemia when adjusted with gravidity. In severe anaemia Group – A proportion of patient from rural area (72.8%), unbooked patient (84.7%) was more compared to Group – B (32.4% & 43.8% respectively). The difference was statistically significant. It indicates that there is less awareness regarding anaemia and less utilization of antenatal care among the women in rural areas.

Virendra P. *et al* (2012) in his study found that prevalence of anaemia among women of rural area of Delhi was 96.5% and it was concluded significantly higher as compared to urbanarea. [8] According to religion no significant difference was observed in both groups. Proportion of illiterate (66.7%) and low socioeconomic status (87.1%) women was significantly more in Group – A as compared to Group – B (21.9 % and 24.3% respectively) , indicating less awareness about anaemia , hospital facility and proper antenatal checkup , lack of funds among the illiterate and lower socioeconomic class. As seen in Table – 2 Proportionof women with higher parity were more in Group – A (9.0%) as compared to Group – B (5.7%). Mean

parity was 2.39 ±1.32 in Group – A and 2.17± 0.87 in Group – B. No significant difference was observed. Proportion of women was more in 28-32 weeks of gestation in Group – A(15.7%) as compared to Group – B (1.9%) and the difference was statistically significant . Maternal anaemia was found as an independent risk factor for preterm delivery.

Majority of women in both groups had vaginal delivery: 69.5% in Group – A and 87.6% in Group – B. Proportion of women who had LSCS was significantly more in Group – A(30.5%) as compared to Group – B (12.4%). Similar results were obtained by Umber BJ *et al* (2005) in which it was concluded that rate of caesarean section was found more in anaemic group as compared to normal hemoglobin group. Preterm delivery was significantly higher in anaemic group. [9] On examination of P.B.F maximum women in Group – A had Microcytic hypochromic Anaemia (79.0%), Macrocytic Hypochromic Anaemia (11.4%), Dimorphic Anaemia (5.7%). In Group – B all women were normocytic normochromic. The difference was statistically significant. Rangnekar*et al* (1993) revealed that microcytic hypochromic anaemia was more prevalent suggesting nutritional inadequacy as a cause of anaemia.[10]

Mean maternal hemoglobin of women in Group – A was 5.64 ± 0.96gm/dl and in Group – B was 12.03 ± 0.63gm/dl. The difference in mean hemoglobin was statistically significant. Result of our study was comparable with study done by Riffat*et al* (2008) where it was concluded that mean hemoglobin in severe anaemia was 6.1± 0.16gm/dl and in normal Hb group was 11.6 ± 0.6gm/dl and the difference was statistically
significant. [11]

As shown in Table – 4 maternal complications : preterm labour (42.8% v/s 14.3%), Preeclampsia (16.1% v/s 3.3%) , sepsis (3.8% v/s 0.0 %), CHF (1.4% v/s 0.0%) and third stage complications : PPH and retained placenta (10.4% v/s 1.9%) were significantly more in Group – A as compared to Group – B and the difference was statistically significant . However there was no significant difference in maternal mortality among the study group (0.47% v/s 0.0%).

Abdel A *et al* (2011) concluded that the corrected risk for preeclampsia with severe anaemia was more (OR = 3.6,95% CI:1.4 – 9.1 , P = 0.007) as compared with women with no anaemia .[12] Result of our study was comparable with the study performed by Ghimire *et al* (2013)in which it was concluded that anaemic women had an increased risk of pregnancy induced hypertension (odds ratio of 5.06) , preterm labour , postpartum haemorrhage and sepsis . However there was no difference in maternal mortality among study groups.[13] Jain Preeti*et al* (2013) found a significant correlation between anaemia and development of preeclampsia, eclampsia, and preterm labour (P value <0.05).[14] Naushaba*et al* (2013) concluded that anaemic group preterm delivery was in 56.25%, Retained Placenta in 1.3%, PPH in 4.1% and Sepsis was noted in18.2%. Maternal death occurred in 0.9%. All these were significantly higher in women of anaemia group as compared to the normal haemoglobin group.[15]

All women in Group – A with severe anaemia received Blood transfusion. In Group – B none of the women received blood transfusion . As shown in Table – 5 perinatal complications were more in anaemic Group – A compared to non – anaemic Group – B : low birth weight (55.2% v/s 9.1%), Apgar score < 7/10 (10.9% v/s 2.4 %) , still birth (10.9 % v/s 3.3%) , IUGR (9.0 % v/s 5.2%) , birth asphyxia (10.9% v/s 0.00%) and admission NICU (14.7% v/s 9.5%) and the difference were statistically significant. However there was no significant difference in early neonatal death amongboth the groups (0.0% v/s 0.0%). The mean birth weight was 2.49±0.56 kg in Group – A lower than 2.93±0.33 in Group – B; difference was statistically significant (P< 0.001S). Ghimire *et al* (2013) concluded that the frequency of low birth weight and Apgar score <7/10 at birth was more in anaemic group and the difference was statistically significant. [12]

Colomer*et al* (1990) analyzed the relation between the hemoglobin concentration of pregnant women and the risk of anaemia in their infants at 12 months of age. Infants born to anaemic mothers were more likely to become anaemic themselves. [16] Levy A *et al* (2004) concluded that the incidence of asphyxia (40%), intrauterine growth retardation (40%) and intrauterine growth retardation (38%) were significantly higher in anemic group as compared to normal haemoglobin.[17] Nadia Mudher *et al* (2010) concluded that foetal hemoglobin decreases significantly with decreasing maternal hemoglobin. There is a linear relationship between maternal and cord blood hemoglobin. There was significant increase in number of newborn developing anaemia in severely anaemic mothers.[18]

Result of our study was comparable to study of Naushaba*et al* (2013) who concluded that perinatal mortality was seen in 2.3% and intrauterine death in 8.9%, which were significantly more as compared to the non anaemic group.[15] Similar results were seen in study of Sangeeta V.B. *et al* (2014) who concluded that the newborns of anaemic mothers had 1.6 times increased risk of having an Apgar score of < 5 at 1 min. The risk of IUGR was two times higher among the anaemic group as compared to the normal haemoglobin group. Women in anaemic group also had more risk of still
birth. [19]

CONCLUSION

Anaemia in pregnancy is a major health problem in developing countries. Anaemia contributes significantly to maternal mortality and morbidity. It causes both direct and indirect maternal deaths from cardiac failure, infection, haemorrhage and pre-eclampsia. Maternal anaemia is an important cause of preterm birth, low birth weight and perinatal mortality. The prevalence of anaemia is more in pregnant women and is due to illiteracy, ignorance, low socioeconomic status, late antenatal booking and lack of proper antenatal care and noncompliant behaviour. By keeping this in view, it is recommended that good antenatal care should be made available, accessible and affordable to all pregnant women through partnership between all tiers of government and non-governmental organizations. Creating awareness through public health programs and fortification of food will improve nutritional status of pregnant women. Early attention should be given to adolescent age group for better nutrition, education levels, delayed marriage not before 18 years and post-ponement of first pregnancy till 21 years of age. Awareness regarding dietary habits, small family norms, birth interval and regular ANC and regular intake of iron must be created.. Timely identification of women with severe anaemia and associated maternal and foetal complications and corrective actions for identified problems during their management like

antepartum haemorrhage, postpartum haemorrhage can help in reducing maternal mortality and morbidity**.**Efforts therefore need to be directed not only to correct anaemia but to prevent anaemia,so that we can achieve the millennium development goal of reducing the maternal mortality rate by three quarters.

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